

Book review

Advances in Organometallic Chemistry, Volume 23; edited by F.G.A. Stone and R. West, Academic Press, Inc., Orlando, San Diego, New York, London, Toronto, Montreal, Sydney, Tokyo, 1984, viii + 324 pages, US \$65. ISBN 0-12-031123-2.

This is the twenty-third volume of a well-established and well-respected series, and the format of this edition does not vary from the norm. It contains five reviews of topics of direct relevance to organometallic chemists, entitled "The Electron-Transfer Reactions of Mononuclear Organotransition Metal Complexes" (N.G. Connelly and W.F. Geiger; 93 pages; 541 references), "Redistribution Reactions of Transition Metal Organometallic Complexes" (P.E. Garrou; 35 pages; 85 references), "Silyl, Germyl and Stannyl Derivatives of Azenes, N_nH_n : Part 1. Derivatives of Diazene, N_2H_2 " (N. Wiberg; 61 pages; 88 references), "Polarisation Transfer NMR Spectroscopy for Silicon-29: The INEPT and DEPT Techniques" (T.A. Blinka, B.J. Helmer and R. West; 26 pages; 21 references) and "C- and O-Bonded Metal Carbonyls: Formation, Structures and Reactions" (C.P. Horwitz and D.F. Shriver; 87 pages; 276 references).

There can be little doubt that the article describing the redox reactions of organometallic transition metal complexes will become the most cited of the articles in this volume. This excellent article covers the more recently reported work upon the electron transfer properties of mononuclear transition metal organometallic and carbonyl compounds (the former compounds being categorised according to the bonding mode of the organic moiety). The review is not comprehensive (by design), though given the large number of references included, one might be excused for thinking it so. Rather, it is a critical treatment of the subject material. Included are some of the interdisciplinary aspects of electron transfer reactions and attention is drawn to some of the 'holes' in the literature (e.g. complexes that are related by one-electron transfer, but which have not yet been studied electrochemically). The text and tables are well organised and the illustrative material is clear and concise (but see below). Overall the article will be of great value to a wide variety of practising chemists and the complementary review upon the electrochemistry of bi- and polynuclear compounds is awaited with interest.

Garrou's article describing redistribution reactions (alias disproportionations, symmetrisations, metathetic reactions, scrambling reactions or transfer reactions) brings together a disparate body of data to produce a very useful and interesting overview of the topic, which highlights the dearth of quantitative studies. It is of some interest to note that of the 88 references in the review of diazene derivatives, 42 are to work (both published and unpublished) of the author, and 12 are to dissertations of his students. However, as much of the original work is published in German, it is extremely useful to have a detailed and thoughtful account available in English, and there is no denying the fas-

mination of the elegant chemistry surrounding the $RN=NR$ derivatives. The article describing ^{29}Si NMR spectroscopy is not so much a review as a detailed discussion of the use and theory of polarisation transfer techniques. Indeed, the authors suggest that two sections of their account, taken together, may be used as a brief instruction manual for ^{29}Si polarisation transfer spectroscopy. This article is clearly written with both experience and authority, and is required reading for all silicon chemists. The final article, the review of metal carbonyls, focuses upon complexes in which the CO is bonded both through carbon and oxygen. After an introduction describing the physical manifestations of the various CO bonding modes (e.g. bond lengths and angles, $\nu(\text{C}=\text{O})$ and $\delta(^{13}\text{C})$), the second part of the review surveys the formation, structures and spectral properties of Σ -CO-compounds (i.e. compounds in which the CO (whether terminal, edge-bridging or face-bridging) is C-bonded to one metal centre, whilst being σ -O-bonded to another metal centre). The next, shorter, section describes Π -CO compounds (i.e. compounds in which the CO is C-bonded to one metal centre, whilst being π -C=O-bonded to another metal centre), and the article concludes by examining the influence of the CO bonding mode on carbonyl reactivity. It is unfortunate that Horwitz and Shriver have overlooked a recent authoritative review of bridging carbonyls in transition metal complexes (R. Colton and M.J. McCormick, *Coord. Chem. Rev.*, 31 (1980) 1), many of the ideas in which would have made fruitful additions to their approach.

Thus, overall, this is a very interesting collection of reviews, maintaining the expected standard of this meritorious series, which is now an obligatory purchase of all chemistry libraries attached to academic and industrial research laboratories. Two features which do offer room for improvement, though, are the quality of production of the inset equations, and the nature of the cumulative index. In a volume which is type-set and has a pleasing layout and presentation, it is rather a pity that what appears to be portions of the original typescript are reproduced as numbered equations and schemes. I also feel that the cumulative index would be appreciably more useful if it were organised around topics and key words, rather than titles. For example, a reader interested in the carbon-metal bond is scarcely going to think to look it up under 'O' for "Of Time and Carbon-Metal Bonds". However, these are minor criticisms of an otherwise outstandingly successful series, which continues to produce volumes of current interest to a wide range of readers, and has not fallen into the trap of so many long-running series by featuring more and more specialised articles on subjects of less and less interest.

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